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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/826,274	04/04/2001	Joseph C. Olson	V0077/7154	2953

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EXAMINER

DONG, DALEI

ART UNIT PAPER NUMBER

2879

DATE MAILED: 04/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/826,274

Applicant(s)

OLSON ET AL.

Examiner

Dalei Dong

Art Unit

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(Signature)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 12 and 21 is/are allowed.
- 6) ☒ Claim(s) 1-11, 13, 14, 17-20 and 22-25 is/are rejected.
- 7) ☒ Claim(s) 15 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5, 8-11, 13, 14, 17-20 and 22-25 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,339,691 to Morimiya.

Regarding to claim 1, Morimiya discloses in Figure 5, column 4, lines 1-60, a cathode sub-assembly for a ion source comprising: an indirectly heated cathode (47) and a support rod (45 and 46) fixedly attached to the indirectly heated cathode (47) for supporting the cathode with an arc chamber (2) of the ion source.

Regarding to claim 2, Morimiya discloses in Figure 5, the support rod is attached to a surface of the cathode facing away from the arc chamber.

Regarding to claim 3, Morimiya discloses in Figure 5, the cathode is in the shape of the disk.

Regarding to claim 4, Morimiya discloses in Figure 5, the support rod is fixedly attached at or near the center of the cathode, along an axis of the cathode.

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Regarding to claim 5, Morimiya discloses in Figure 5, the support rod is in the shape of a cylinder and the diameter of the cathode is larger than the diameter of the support rod.

Regarding to claim 8, Morimiya discloses in Figure 5, the support rod mechanically supports and conducts electrical energy to the cathode.

Regarding to claim 9, Morimiya discloses in Figure 5, column 4, lines 1-60, a cathode sub-assembly for use in an indirectly heated cathode ion source which includes an arc chamber housing (2) that defines an arc chamber, comprising: a cathode sub-assembly, including a cathode (47) and a support rod (45 and 46) fixedly mounted thereto; a filament (38) for emitting electrons, that is positioned outside the arc chamber (2) in close proximity to the support rod of the cathode sub-assembly; and a cathode insulator (41) for electrically and thermally isolating the cathode from an arc chamber (2) housing, that is disposed around the cathode of the cathode sub-assembly.

Regarding to claim 10, Morimiya discloses in Figure 5, a filament (38) disposed around the support rod (45 and 46) in close proximity to the cathode (47) and isolated from the plasma in the arc chamber (2).

Regarding to claim 11, Morimiya discloses in Figure 5, a filament (38) disposed around the support rod (45 and 46) in close proximity to the cathode (47) and isolated

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from a plasma in the arc chamber (2), wherein the filament (38) is fabricated of an electrically conductive material and includes an arc-shape turn having an inside diameter greater than or equal to the diameter of the support rod (45 and 46).

Regarding to claim 13, Morimiya discloses in Figure 5, column 4, lines 1-60, a cathode assembly for use in an indirectly heated cathode ion source which includes an arc chamber housing (2) that defines an arc chamber, comprising: a cathode sub-assembly, including a cathode (47) and a support rod (45 and 46) fixedly mounted thereto; a filament (38) for emitting electrons, that is positioned outside the arc chamber (2) in close proximity to the support rod (45 and 46) of the cathode sub-assembly; a cathode insulator (41) for electrically and thermally isolating the cathode from an arc chamber housing (2), that is disposed around the cathode of the cathode sub-assembly; wherein said cathode insulator (41) includes an opening having a diameter that is larger than or equal to the diameter of the cathode.

Regarding to claim 14, Morimiya discloses in Figure 5, a vacuum gap is provided between the cathode insulator and the cathode to limit thermal conduction.

Regarding to claim 17, Morimiya discloses in Figure 5, a method of supporting and indirectly heating a cathode of an ion source comprising steps of supporting the cathode (47) by a rod (45 and 46) fixedly attached to the cathode; and bombarding the cathode with electrons.

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Regarding to claim 18, Morimiya discloses in Figure 5, column 4, lines 1-60, a cathode assembly for an ion source comprising: a cathode (47); a support rod (45 and 46) fixedly attached to the cathode; a cathode insulator (41) for electrically and thermally isolating the cathode from an arc chamber housing (2); and an indirect heating device (38) for indirectly heating the cathode.

Regarding to claims 19, 20, 22, 23 and 24, the method of forming the device is not germane to the issue of patentability of the device itself. Therefore, these limitations have not been given patentable weight.

Regarding to claim 25, Morimiya discloses in Figure 5, column 4, lines 1-60, a cathode sub-assembly for an ion source comprising: an indirectly heated cathode (47) and a support rod (45 and 46) press fitted to the indirectly heated cathode (47) for supporting the cathode within an arc chamber (2) of the ion source.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claims 6 and 7 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 4,339,691 to Morimiya in view of U.S. Patent No. 4,783,595 to Seidl.

Regarding to claim 6, neither Morimiya nor Seidl discloses the diameter of the cathode is at least four times larger than the diameter of the support rod. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have adjust the diameter of the support rod in accordance to the cathode, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding to claim 7, Morimiya discloses the claimed invention except a spring-loaded clamp for holding the support rod.

Seidl teaches in Figure 1, column 8, lines 28-55, a spring loaded clamp (7) for holding the support rod.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilize the spring loaded clamp of Seidl for the cathode sub-assembly of Morimiya in order to exert an compression force to keep the cathode tightly fixed within the recess and further provided improved and reliable electrical contact.

Allowable Subject Matter

5. Claims 12 and 21 are allowed.

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6. The following is an examiner's statement of reasons for allowance:

Regarding to independent claim 12, the prior art of record teaches a cathode assembly for use in an indirectly heated cathode ion source which includes an arc chamber housing that defines an arc chamber, however prior art of record filament is fabricated of an electrically conductive material and includes an arc-shaped turn having an inside diameter greater than or equal to the diameter of the support rod, and wherein a cross-sectional area.

Regarding to claim 21, claim 21 is allowable because of dependency upon an allowable independent claim.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

7. Claims 15 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record taken alone or in combination fails to teach or suggest cathode insulator includes a flange.

Response to Arguments

8. Applicant's arguments filed January 13, 2005 have been fully considered but they are not persuasive.

In response to Applicant's argument that the Morimiya reference fails to teach or suggest an indirectly heated cathode as recited in the claims of the present application. The Applicant also claim the definition of indirectly heated cathode is defined as a relatively massive structure for the cathode that is electrically and thermally isolated from its surroundings and a filament isolated from the plasma in the arc chamber. The Examiner asserts that the discharge apparatus of the Morimiya reference does satisfies the definition provided by the Applicant, wherein the cathode 47 is electrically and thermally isolated from its surroundings (hollow cathode 2) and a filament (heater 38) isolated from the plasma in the arc chamber as clearly shown in Figure 5. Thus, the Examiner asserts that the Morimiya reference teaches the claimed invention and maintains the rejection.

Also, in response to Applicant's argument that the Seidl reference fails to teach or suggest a spring loaded clamp for holding a support rod for an indirectly heated cathode. The Examiner asserts that clearly shown in Figure 1 of the Seidl reference, wherein the spring 7 is holding a support rod for an indirectly heated cathode. Albeit, the intended use of the spring may be different however the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference

as compared to the prior art. See *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 312 F.2d 937, 939, 136 USPQ 458, 459 (CCPA 1963).

Further, in response to Applicant's argument regarding to claim 6, the Examiner asserts that as Applicant as cited the claimed diameter for the support rod in claim 6 is merely an example of the diameter for the support rod and Applicant fail to provide testing or experiment to demonstrate the benefits or the unexpected results achieved by having the diameter of the support rod at the claimed thickness. The Examiner asserts that it is old and well known in the art to provide a wide surface area for the cathode in order to facilitate the emission of the electrons as shown in the Morimiya and the Seidl reference. Thus, it would have been obvious to one having ordinary skill in the art to have a wide cathode surface area in order to facilitate the emission of the electron, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalei Dong whose telephone number is (571)272-2370. The examiner can normally be reached on 8 A.M. to 5 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar Patel can be reached on (571)272-2457. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



D.D.
March 25, 2005



Vip Patel
Primary Examiner
Art Unit 2879